

## **POWER FLUSHING**

What is Scale?

When water is heated naturally occurring calcium or magnesium carbonate is deposited in the form of lime scale. The higher the temporary water hardness, the higher the alkalinity of the water or the higher the temperature the water is heated to the more scale will be deposited.

What is Sludge?

Corrosion forms in untreated systems when an electrolytic reaction occurs. This happens when two dissimilar metals carry a different electrical charge.

Basically the radiators and boiler are rotting away.

Black magnetite sludge (ferric oxide) forms dense sediments in radiators and the boiler. It clogs pumps and reduces the flow of water through pipes and radiators. It is often a result of a system not having been flushed out correctly after installation. Advanced state of corrosion is indicated when black water can be drawn from a radiator air bleed, boiler bleed or a drain cock. Black oxide is formed in all untreated heating systems.

Reddy brown water and deposits (ferrous oxide) is caused by air entering the system. It can enter in various ways; micro leaks on joints, badly designed pipe work layouts, or by frequent intake of fresh oxygenated water.

One of the by products of corrosion is the production of hydrogen gas. If regular gassing of a heating system occurs, great care should be taken, as hydrogen gas is highly flammable.

If scale or sludge forms in the heat exchanger it will produce an insulated coating which will have two effects.

Firstly the heat the boiler produces can't get into the water jacket as well and so ends up leaving through the flue, thus increasing fuel consumption.

Secondly the insulated coating can shield the boiler control stat leading to inaccurate control, the scale also continues to heat the water after the heat source has finished raising the temperature further and causing what is known as localised boiling.

Other symptoms of corrosion are:

Failure of circulating pumps

Sticking motorized or thermostatic radiator valves

Cold spots in the radiators

Leaking joints or radiators/boiler

1mm of scale will increase fuel consumption by 7.5%, while a 12mm layer will raise this figure to 70%.

The most effective way to cleanse the system is to power flush it.

This involves dosing the system with a sludge/scale removing chemical, allowing it to be circulated for a specified time, and flushing out the fouled water with the use of a very powerful pump.

Flushing with water only removes about 10% of the debris in a system; add a power flush and you can expect to remove up to 30%. By using chemicals and a power flush you can remove around 80%.

Once the system is clean it must then be dosed with corrosion inhibitor.

What is corrosion inhibitor?

A corrosion inhibitor is any substance that, when added to a water system, reduces the rate at which corrosion is taking place. In simple terms Corrosion inhibitors form a very thin film that prevents any further corrosion taking place. The film is only maintained by the continued presence of inhibitor in the water. Systems require a sufficient dose to "coat" the internal surfaces of the system plus some excess to maintain this film. If the dose is below the level required to achieve protection, exposed areas of metal will continue to corrode. Over dosing with inhibitor is unlikely to have any detrimental effect.